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African Farming and Food Processing

November/December 2016

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progress

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Farm mechanisation can facilitate increased output of products such as maize. (Image: Shutterstock/Mr Prasong)

LSD is typically characterised by nodules or lumps that appear under the skin.

The Sirius series tractor-mounted models account for most of Lemken's increased sprayer sales in Africa.

African Farming and Food Processing

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Farming Calendar 2017

January		
5	Fier Avicola 2017 *www.fieravicola.com*	QUARTO
24-27	IPM Essen *www.ipm-essen.de*	ESSEN
26-27	Agritech Expo Tanzania *www.agritechexpotanzania.com*	ARUSHA
31-2Feb	International Poultry Show *www.ippexpo.com*	ATLANTA
February		
22-25	Sudan Poultry Expo *www.expoteam.com*	KHARTOUM
26-2March	SIMA 2017 *www.simaonline.com*	PARIS
March		
14-15	Commercial Farm Africa *www.cmtevents.com*	DAR ES SALAAM
20-21	GFIA *turretme.com*	ABU DHABI
23-25	Nigeria Poultry and Livestock Expo-NIPOLI 2017 *www.nipoliexpo.com.ng*	LAGOS
28-31	1st All Africa Postharvest Congress and Exhibition *www.knowledge4food.net*	NAIROBI
April		
26-28	Fresh Produce Africa *www.hppexhibitions.com*	NAIROBI
27-29	Agritech Expo Zambia *www. spintelligent.com*	CHISAMBA

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Agric Expo ends with assurance for stakeholders

A TWO-DAY agricultural conference which brought together agro-allied industries, entrepreneurs, seed companies and other stakeholders to showcase their technologies took place recently in Abuja. Organised by Agrikexpo and the Nigerian Agribusiness Group (NABG), the conference featured an impressive turnout of participants and actors in the country's agricultural sector and created a platform for networking for agribusiness growth.

The leader of the Nigerian Agribusiness Group, Emmanuel Ejewere, one of the conveners of the programme, told newsmen that with the renewed commitment to agriculture, the time had come to look at the potentials in the sector. He said the essence of the programme was to allow key actors to come together and build a good network to drive the sector.

Boosting West Africa's regional grain trade

THE LEVEL OF intra-regional trade of cereals such as maize, millet, sorghum and rice is lagging way below its potential in West Africa, despite opportunities from flourishing local production and strong demand from growing urban populations. A conference, held recently in Ouagadougou, on 'How to structure the grain trade in West Africa: which market instruments and public policy measures?' examined some of the current constraints to increased intra-regional trade in the cereals sector, as well as ways of making it more dynamic.

In a region where the population is almost doubling every twenty years, grain crops account for one-fifth of total cultivated land area and provide part-time work for around 80 per cent of the West African population. But despite increases in production from 16mn tonnes in 1980 to 63mn tonnes in 2015, less than 1.5mn tonnes of local grain crops are sold in cross-border trade in the region. The conference will examine ways of creating a regional policy environment to encourage greater private sector involvement in the grain trade and improve the capacity of trade support institutions, so as to promote efficient and stable regional grain markets.

Future of animal husbandry highlighted at Eurotier

EUROTIER, THE INTERNATIONAL livestock exhibition was recently concluded in Hanover, Germany, where it saw 163,000 total visitors this year

Eurotier organiser DLG CEO Dr Reinhard Grandke stated: "With 2,629 exhibitors and 163,000 visitors, including 36,000 from outside Germany, the EuroTier 2016 exhibition has delivered again, breaking the previous record attendance of EuroTier 2012."

Eurotier organiser DLG CEO Dr Reinhard Grandke.

Around 36,000 visitors came from abroad – from European as well as non-European countries – including North and South America, Middle East and Asia.

The event saw a total of 2,629 exhibitors from 58 countries presenting their innovations and product developments for modern and practical agriculture worldwide, specifically, innovations in fields of barn construction and feeding, as well as electronics, data management, and actuator and control technologies were appreciated. These tools go a long way in tackling challenges in the international market that is characterised by social and political demands, along with fluctuating markets.

Highlights of the show included: 'World Poultry Show', that established itself as the global meeting place for the poultry industry, with breeders, producers and processors from all over the world taking advantage of the comprehensive – but at the same time remaining highly specialised – offering, enabling them to exploit the positive prospects in the market; a dedicated dairy and beef area; pig sector solutions on show that reflected the changing regulatory environment and EnergyDecentral 2016 that also showcased the Biogas convention 2016.

The next EuroTier, which will include the EnergyDecentral exhibition, will take place from 13 to 16 November 2018 in Hanover.

BASF launches campaign to celebrate farmers

THE WORLD'S LEADING chemical company, BASF, has developed a new campaign aimed at celebrating farmers across the globe and supporting agriculture to enable increasing production of enough food for the burgeoning world population estimated to reach nine billion by 2050. This figure has sent food experts to the drawing board with a warning that current production methods are not compatible with the required high farm productivity.

'Farming, the biggest job on earth,' is a campaign that seeks to assist farmers' access latest farming innovations, ensuring soil remains healthy and connecting farmers to high quality, fast-maturing drought-tolerant seed varieties. "In 1960 the total agricultural areas was 4,300 sq m per head, in 2005 it shrunk to 2200 and by 2030 this will shrink further to 1800. This means that the same parcel of land has been feeding more people. Population grows, land does not. The only way we can ensure that parcel of land can continue feeding more mouths is to make it more productive through innovation," said Gift Mbaya, sub hub manager - crop protection & public health at BASF East Africa Ltd, during the National Farmer's Awards 2016.

The campaign is timely especially in Kenya, coming at a time when recent reports have indicated that the country is struggling to feed its population.

"BASF is working with farmers to keep the soil fertile and fruitful with the right amounts of water and nutrients. Stewarding the land and planning for the future," reiterated Mr Mbaya. Without technology, food production becomes a huge task explaining why BASF is supporting farmers to access innovation, solutions and experts to enable them to improve productivity, increase efficiency, and stay at the cutting edge of their profession ensuring growing demands are met, year after year.

OCP to invest in Tanzanian agricultural development

TANZANIAN FERTILIZER COMPANY (TFC) and OCP Group, the largest phosphate producer in the world and a leading global fertiliser player, have signed a memorandum of understanding for the development of the fertiliser market and agriculture in Tanzania.

A farmer evaluates beans applied with NPK fertiliser. (Image: IITA)

The purpose of this agreement is to assess collaboration opportunities in order to improve and develop the agricultural sector in the United Republic of Tanzania.

Under the terms of this MoU, several collaboration areas are foreseen, including the exploration of the possibility to develop local production using locally available raw materials and import the non-available from OCP, who will ensure the supply and availability of phosphate-based fertilisers (DAP/NPKs) at a competitive price.

Further, this agreement will also contribute to the research and development to develop specific formulae for Tanzanian soils and crops, as well as the improvement of fertiliser distribution assets in Tanzania and development of new warehouses and bagging facilities in the remote regions.

AGCO restructures to expand in Africa

AGCO, THE WORLDWIDE manufacturer and distributor of agricultural equipment and solutions, has announced a realignment of its regional structure which will see an increase in its on-the-ground presence in Africa and a further expansion of the company's significant operations on the continent.

The company will reorganise its Asia Pacific Division, effective 1 January 2017, to include Africa, expanding its on-the-ground presence and operations on the continent.

"With this new move, the realigned Asia Pacific and Africa (APA) region will be strongly positioned to leverage the synergies of similar market dynamics in the two territories," said Gary Collar, newly-appointed AGCO senior vice president and general manager, APA.

To support the realignment and further boost service to customers and distributors, AGCO will open a new regional headquarters in Johannesburg in early 2017. Alongside the new regional headquarters, the firm will also open a new Future Farm in Francophone-speaking West Africa. Both initiatives are designed to complement AGCO's existing parts distribution operation and training centre in South Africa and Future Farm in Zambia.

"Among these key synergies are the emergence of a growing smallholder farmer segment product and application similiarities, shared consumer finance patterns and growing trade between the two regions," Collar added.

The AGCO Africa team will be headed by Nuradin Osman, vice president and general manager Africa.

He added: "The new regional structure will build on the significant progress that AGCO has made over recent years and further drive our customer service and business growth in Africa."

AGCO's future farm grain and poultry learning centre in Zambia. (Image: AGCO)

Mr Osman has been with AGCO for 12 years and has a solid track record ingrowing the company's business in Africa. Prior to this new appointment, he was AGCO director of operations Africa and Middle East. He is a proven thought leader in Africa and instrumental in raising the profile of key issues such as the significance of mechanisation, protein production and post-harvest storage solutions in strengthening the African agricultural sector. He will have overall responsibility for all AGCO companies and brands in Africa with the exception of AGCO's manufacturing operation in Algeria which is subject to a separate Joint Venture.

New FVG Select 2017 event

ON 13 AND 14 June, 2017, Victam International BV will launch a new event and format in Cologne, Germany: FVG Select 2017.

Over the past decade the Victam events have been seen to have changed enormously. Other than moving from Utrecht to Cologne, new specialist events have been introduced – FIAAP for feed ingredients and GRAPAS for grain processing. VICTAM itself has broadened its industry profile as it now includes biomass pelleting. FVG is the abbreviation for FIAAP/VICTAM/GRAPAS and it encapsulates all the industries present at the show. Victam International BV will therefore introduce FVG as the new brand name for its events.

With FVG Select 2017, Victam International BV introduces a completely new concept and therefore it cannot be compared to the regular FVG exhibitions. The focus of FVG Select 2017 is networking. This will be facilitated through an extensive conference and business matchmaking programme. The conferences will be organised in collaboration with conference partners: AEBIOM, Aquafeed.com, IFF and Wageningen University, Perendale Publishers and Watt Global Media. As the name of the event implies, FVG Select, there will only be a limited number of booths available at the industry expo.

The matchmaking programme focusses on the high quality meetings during FVG Select 2017. It will consist of a combination of an online tool, which allows exhibitors and visitors to plan their appointments very efficiently and a personal approach by matchmaking consultants.

On 13 June, a networking reception for exhibitors, visitors and conference delegates will take place after the conference programme closes. The industry delegates will be charged a small admission fee to visit the industry expo and a separate fee will be charged for the conferences.

Drought-resistant grass variety for East Africa

A RESEARCH ORGANISATION, that focuses on tropical agriculture, has said that a drought resistant grass variety that it has developed could boost milk and meat production in livestock reared across East Africa by 40 per cent.

Improved Brachiaria grasses broaden horizon for Kenya's livestock sector. (Image: NAFIS)

According to a study launched by the International Centre for Tropical Agriculture (CIAT) in Nairobi, brachiaria grass could offer respite to East African livestock farmers, who are grappling with loss of fodder occasioned by climatic stresses.

"Our research shows that brachiaria grasses could be the cornerstone of productive and resilient livestock systems that quickly provide more milk, meat and money for small-scale farmers," said Steven Prager, a scientist at the CIAT and a co-author of the study.

He said that brachiaria grass had become "the most extensively used" forage in the world, with seed production already commercialised in major livestock farming hubs like Brazil.

Prager said brachiaria grass was native to Africa, but its performance and nutritional qualities had been improved through decades of work by CIAT's plant breeders in Colombia.

Olam Palm Gabon wins RSPO certification

OLAM INTERNATIONAL HAS crossed a significant milestone after its first palm plantation went from being the first in Africa to receive the Roundtable on Sustainable Palm Oil (RSPO) New Planting Procedure verification to also becoming the first-ever new development in Africa to have its working plantation RSPO certified, including the mill.

The Awala plantation in Gabon was Olam's first venture into upstream palm plantations in a joint-venture with the Republic of Gabon. Development began in 2011 as one of two major projects for Olam Palm Gabon (OPG) in the country.

The plantation of 6,700 ha lies within a 20,000 ha lease, the remainder of which is actively managed by Olam for conservation of biodiversity and forest carbon, and protection of water catchments, in fulfilment of RSPO requirements. This certification has single-handedly boosted Africa's RSPO certified production hectares by 30 per cent from 21,666 ha.

The other major development for OPG is the Mouila plantation, where OPG has already planted 31,000 ha in full compliance with RSPO guidelines and is progressing towards certification of that area in 2017 as planned. As in Awala, Mouila will also have a very significant area set aside for conservation requirements as per the RSPO guidelines.

Upon reaching full production capacity by 2023, the two plantations will deliver up to 22 metric tonnes of fresh fruit bunches (FFB) and 5.2 metric tonnes of oil per hectare, significantly complementing the existing stock of sustainable palm production in Africa.

Datuk Darrel Webber, CEO of RSPO, said: "We commend Olam for embedding sustainability at the very start of their operations. It is critical for all companies, especially those operating in a new frontier like Gabon, to plan and account for sustainability practices in land development processes from the start. We rely on all of our members in Africa to be outstanding ambassadors for sustainability, hopefully as models for sustainable transformation in Africa."

New Holland Agriculture to buy Kongskilde

NEW HOLLAND AGRICULTURE will expand its wide offering with new implement product lines as a result of CNH Industrial's agreement to acquire the agricultural Grass and Soil business of Kongskilde Industries, part of the Danish Group Dansk Landbrugs Grovvareselskab (DLG AmbA). This business develops, manufactures and sells solutions for agricultural applications in the tillage, seeding and hay and forage segments under various brands, including Kongskilde, Överum and JF Kongskilde will continue to operate through its current sales organisation and its dealer and importer network ensuring continuity in its customers' support. This acquisition will create a major extension and enhancement of New Holland's offering with the addition of a key product portfolio

3D Drone Map will revolutionise lives of African farmers

MANY FARMERS DREAM of being able to visualise their land from above.Visualising their fields can help them predict their upcoming yield, prioritise resources for areas where their crops might be suffering, and plan ahead. Some large-scale farmers, like Keimetit Chemilel, who grows vegetables, corn, and other cereals in Kenya's Rift Valley and Kitale areas, have used helicopters to help survey their land, but many farmers don't have such a luxury. Instead, they are turning to lower-cost technologies to help them assess their land from above, like drones.

Drones, often referred to as Unmanned Aerial Vehicles (UAV), have become popular in Kenya and are becoming increasingly popular in the agricultural industry – particularly in South Africa, where companies like 3D Drone Map are bringing drones to everyday farmers in the hopes of helping them improve their businesses.

COP22: Adaptation in African agriculture urgently needed

IN MARRAKECH, THE Moroccan government recently hosted the first UN Climate Change Conference since delegates from nearly 200 countries signed the historic Paris Agreement one year ago. The occasion has prompted Morocco to urge other African nations to be proactive in fighting climate change and vocal in international dialogue.

"Africa is progressing and asserting itself in the international arena… Morocco will defend the position of our continent, which is greatly affected by climate change and sustainable development issues," said King Mohammed VI. To respond to climate change, the IFAD-funded Adaptation in African Agriculture (AAA) initiative promotes and fosters the implementation of specific projects to improve soil management, agricultural water control and climate risk management. Proponents believe the initiative can be a platform for a stronger collective voice for adaptation in African agriculture, and a means to contribute to countries' Nationally Determined Contributions (NDCs), or climate action plans. "Smallholders cannot shoulder the costs of making agriculture more sustainable alone. In Africa, there is a need for better policies that promote technical assistance, smarter subsidies that incentivise adoption of climate-smart practices and broader access to land, financial products, infrastructure and markets," said Margarita Astralaga, director of IFAD's Environment and Climate Division.

The AAA initiative promotes and fosters the implementation of specific projects to improve soil management, agricultural water control and climate risk management. (Image: AlgérieEco)

The AAA initiative, therefore, is a programme for resilient agriculture in Africa that promotes better working conditions for small rural producers. It focuses on funding soil fertility, arboriculture and agroforestry, greater carbon sequestration in soils, rolling out agricultural insurance, and broadening coverage of meteorological information and early warning systems. To implement its agenda, it is seeking US$30bn in public climate funds.

Furthermore, many of the solutions to climate and food challenges can be found at the intersection of Africa, agriculture and adaptation. 65 per cent of the world's unused arable land is in Africa, making it a potential breadbasket for a growing population. Generally, small farming systems are still traditional and therefore able to modernise very quickly (using digital tools, new farming techniques, and renewable energy). And finally, agriculture is a huge source of jobs, especially for young people capable of adopting more science-based and business-oriented modifications to agricultural practices.

Morocco-Rwanda launch agriculture partnership programme

"LAUNCHED IN APRIL 2008, the ambitious Moroccan Green Plan was aimed at turning the agricultural sector into an important lever for socio-economic development," said Agriculture and Fisheries Minister, Aziz Akhannouch. The Minister added that "this strategy has contributed to increasing the income of thousands of small farmers and improving their living conditions."

The Morocco-Rwanda agriculture partnership programme is based on sharing the Moroccan expertise to meet the Rwandan potential, said the minister, noting that this programme seeks to promote technical co-operation in the fields of irrigation infrastructure and animal health.

It is also meant to help Rwandan farmers benefit from the expertise of Morocco's "groupe Crédit agricole", the "Mutuelle Agricole Marocaine d'Assurances" (MAMDA) and OCP group regarding, respectively, the integration of small farmers in systems of funding, and of multi-risk insurance and the setting up of a database on soil fertility (fertility card).

The minister underlined that Morocco proposes an ambitious initiative on the adaptation of African agriculture and the reinforcement of its resilience to face climate change.

US startup plans African expansion with solar kits

A US STARTUP, that sells solar-powered irrigation kits to small-scale farmers in Kenya, plans to expand in East Africa, where regular droughts often result in food shortages.

SunCulture, which started business in New York four years ago, has sold almost 1,000 units of the equipment that costs as much as US$2,400 in deals that also solve key challenges for growers in Kenya: access to finance and a steady off-take market. It plans to take operations into Tanzania, Uganda and Rwanda in the coming years, marketing director Kathryn Weichel said recently in Nairobi.

"The first thing we did when we started SunCulture was to spend the first seven months with farmers piloting in the field because we needed to test the product and make sure it worked for farmers in Kenya," Weichel said. "We try to provide them with not only the irrigation system, but seeds, fertiliser, agronomy services, after sales services and financing."

As many as 1.3mn people in Kenya face hunger in the coming months as the rainy season, that normally begins in October, is expected to be below average, according to the state-run National Drought Management Authority. In an effort to boost food security, the government is planning to double the area under modern irrigation methods to 405,000 ha within five years.

Less than four per cent of Kenya's 2.2mn ha of arable land is under irrigation, and four-fifths of that territory requires artificial watering to sustain farming, according to the World Bank. SunCulture sold its first kit in Kenya in 2013 and farmers in seven East African countries own the equipment. It is exploring distribution partnerships in other parts of the continent, Weichel said.

Move to tackle dairy production challenges

Pure Jersey cow at Shonga Farm, Kwara State, Nigeria.

IN A BID to bring about development in diary production, European and West African diary farmers have agreed that technology transfer is the best way to tackle challenges.

This was disclosed in a two-day roundtable hosted by Arla Foods (producers of Dano milk powder), CARE Denmark, Billital Maroobe (RBM), Danish Agriculture & Food Council (DAFC) and the Nigerian Federal Ministry of Agriculture (FMARD).

At the roundtable, the stakeholders formed an alliance called 'milk way to development' to focus on how to improve the livelihood of farmers and in the process create job opportunities.

"The alliance focuses on avoiding the negative impact of imports of powdered milk into the region and greater focus on involving local farmers in the value chain so that milk will be more available and safer and be processed into higher value products so that everyone will benefit. The alliance will facilitate technology transfer and investment which will definitely be of benefit to local farmers," said programme co-ordinator, Care Denmark, Mr Rolf Hernoe.

The commissioner, Department of Agriculture, Environment and Water Resources, ECOWAS, Tchambokou Ayassor, further said the alliance was needful, as it will improve business through driving of policy formulation.

Modernising sub-Saharan Africa's farming systems can boost livelihoods, help feed the world.

Modernising sub-Saharan Africa's farming systems

WITH AFRICA SET to play an ever-growing role in feeding the world's bourgeoning population, the United Nations Food and Agricultural Organization (FAO) has stressed that the sub-Saharan region needs modern, efficient – and above all mechanised and environmentally sound – farming system to meet global demand and transform the lives and economies of millions of rural families.

A new FAO report just launched reveals, for example, that farm mechanisation can facilitate increased output of higher value products while eliminating the drudgery associated with human muscle-powered agricultural production. Improved livelihoods for small farmers means increased access to input supply chains and integration in modern food systems, resulting in improved incomes, numerous and renewed business opportunities, among other gains.

"Moreover, agricultural mechanisation in its broadest sense can contribute significantly to the sustainable development of food systems globally, as it has the potential to render post-harvest, processing and marketing activities and functions more efficient, effective and environmentally friendly," said FAO assistant director-general Ren Wang, head of the Agriculture and Consumer Protection Department in a news release on the report.

Modernising sub-Saharan Africa's farming systems can boost livelihoods, help feed the world – UN

The agency's 'Agricultural mechanisation: A key input for sub-Saharan African Smallholders' report underlines that agricultural mechanisation in the twenty-first century should be environmentally compatible, economically viable, affordable, adapted to local conditions and, in view of current developments in weather patterns, climate-smart.

Mechanisation covers all levels of farming and processing technologies, from simple and basic hand tools to more sophisticated and motorised equipment, it goes on to explain, adding that it extends far beyond ploughing and can contribute to productivity gains and new jobs in the post-harvest, processing and marketing stages of local and global food systems.

Farmers in Kaffrine, Senegal inspect agricultural machinery. (Image: FAO/Swiatoslaw Wojtkowiak)

A worker adjusts a plough attachment in Djibo, Burkina Faso. Spare parts must be available for tractors to be useful. (Image: FAO)

As things stand, two-thirds of the power used to prepare sub-Saharan African land for farming is provided by human muscle. Comparable rates are 30 per cent for South Asia and even lower for Latin America.

Farm power an essential agricultural input

"There is no doubt that the application of 'farm power' to appropriate tools, implements and machines is an essential agricultural input in sub-Saharan Africa with the potential to transform the lives and economies of millions of rural families," said Mr Wang.

Overall, FAO stresses that the opportunity provided by mechanisation must be guided in a way that meets small farmers' needs and that does not require a 'Green-Revolution' type of approach with high levels of agrochemical inputs and destructive ploughing operations that threaten soil health and fertility.

According to FAO expert and key author of the report, Josef Kienzle, mechanisation allows smallholders both to intensify and expand agricultural production as well as enabling some family members to seek off-farm jobs and incomes.

As rural African youths increasingly migrate to urban centres, the region may face labour shortages along with increasing demand for food to be sent to the cities. Mechanisation can help the often elderly or female farmers who remain in rural areas to keep up with higher output needs, thus contributing to increased food security and climate change mitigation.

It can be achieved when well-managed private sector mechanisation service centres are installed and services are within reach. Interventions from the public sector to help this process include providing specific incentives depending on the mechanisation power source and user type, said the FAO expert.

Roxell gears up for the future with new controller

THE POULTRY INDUSTRY is in constant flux: new regulations, SMART solutions and innovative control systems are gradually being introduced. With the launch of IQON, Roxell, too, is taking a step forward in the digital control of poultry houses.

IQON is a user-friendly automation system that adjusts, controls and monitors the feeding and drinking process in the house. This controller, with its simple and visually strong design, is capable of handling virtually any house layout. The multihouse functionality means that a single controller can be used to control all houses. With just a few clicks the poultry farmer gains access to a plethora of data for each flock: feed consumption, mortality, feed-water ratio, etc.

If something goes wrong in the house, an alarm screensaver will pop up indicating where the problem is occurring.

IQON, Roxell's new user-friendly automation system.

"A poultry farmer is a businessman who keeps a sharp eye on the productivity of his house. He has high expectations that we aim to meet with this new controller," says Davy Meurice, Roxell product owner and part of the creative brain behind this project.

The development of IQON marks an important step for Roxell. Today's poultry industry would be inconceivable without house automation. Roxell is therefore extending the functionalities of the controller by developing new features in the near future.

Management techniques for a hot climate

HOT CONDITIONS SIGNIFICANTLY affect the performance of layers, particularly in temperatures higher than 30°C, a challenge faced by most egg producers in Africa. Getting good technical results requires some adjustments in the management of layer flocks. The main impact of hot temperature is on the daily feed intake, which can affect growth during the rearing period and egg production during the production period.

Ambient conditions must be optimum in terms of density, ventilation, access to water and feed (density on the floor must not be more than six birds/sqm in hot conditions). Fans can be added to increase air speed inside the house (an increase of 0.2m/s reduces the temperature felt by the birds by 1°C). In the case of an open house system, curtains should be added to the side of the house in order to reduce light intensity. Control of bodyweight is very important as good bodyweight is one of the key factors to achieve optimum performance. Any deviation must be detected quickly in order to adapt management as soon as possible and limit the impact on production. A weekly measurement until the end of the growth period (0-30 weeks) is necessary.

Feed presentation must be good in order to optimise feed consumption and get the best possible growth and production. Do not hesitate to maintain starter feed (crumble feed presentation is recommended for the starter feed) until six weeks of age if growth is not good enough in the first weeks. We recommend allowing the birds to empty the feeders in the hot period of the day to guard against selective feeding and to give the last feeding three hours before lights off. The feed formula (protein level in particular) must be adjusted to compensate for lower feed intake levels seen during higher temperature periods.

Water quality can deteriorate more quickly than in temperate countries. Therefore, water must be treated to be of good quality. Chlorination is the easiest way to treat the drinking water. Residual chlorine levels must be checked in the end of the drinking system once per week to ensure that this is effective. Water temperature is also a key point as it influences the feed intake. The water tank must not be exposed to direct sunlight and temperatures should be kept as cool as practical. Flushing the pipes can help to maintain fresh water in the pipes and avoid stagnant water whose bacteriological quality may decrease.

We often see open house systems in hot conditions. This increases the risk of introduction of contaminants in the flock. Strict biosecurity rules must be applied: houses must be bird-proof and rodent baiting stations must be installed around the house. Ideally farms should not be placed close to another poultry house. Single age farms are also desirable.

In case of overheating, electrolytes (KCl) and antioxidant products (C or E vitamins) can be used in the drinking water to reduce stress induced by high temperatures (oxidative stress and respiratory alkalosis).

With these techniques in mind, egg producers in Africa are well equipped to manage the potential challenges of an extreme climate and achieve the best performance from their birds.

By Dr. Paul Grignon Dumoulin, Veterinarian and Technical Specialist, ISA

Although spiking mortality of broiler chickens is no longer a hot topic in the industry, it still is somewhat of a recurrent problem in several parts of the world. Here Angel I Salazar focuses on sanitation, pest control, litter management and feed issues in preventing this malady.

Spiking Mortality Syndrome in broilers

SPIKING MORTALITY IS referred to as a syndrome because there is no single, indisputable, consistent cause and effect relationship clearly and completely defining this malady in all its aspects.

Factors such as broiler metabolism, physiology, lighting programmes, viruses, husbandry practices, feeding strategy, feed texture, house ventilation, breeder flock age and several other culprits have all been implicated at one time or another.

During the late eighties and early nineties, spiking mortality of broiler chickens was first observed in the Delmarva area of the USA. Since that time, review of several sound basic management practices have reduced the incidence of this problem. To be sure, the condition still shows its ugly face with some regularity in many parts of the world. Thus, much basic, practically oriented research work still needs to be done.

There are no air-tight preventative or eradication measures in place. There are some treatment options that offer varying degrees of success in the field. There are only a few effective treatment options or management solutions available to handle this problem.

Quite a few of affected, dying or recently dead birds, are large, plump broilers which were in good/excellent condition and show no signs of emaciation due to long term starvation. (Image: Kharkhan Oleg/Shutterstock)

There are only a few effective treatment options or management solutions available to handle this problem.

Signs/symptoms

When dealing with spiking mortality, one frequently wonders, which came first? Was it the chicken or was it the egg?

Affected birds show a typical posture, lying down on their bellies on top of the litter, leaning forward with their legs extended, out stretched.

Spasms or tremors may or may not be part of the picture. If tremors are present, the situation may be confused with avian encephalomyelitis.

Young broiler chickens develop hypoglycemia and become blind. It seems logical to assume that once a bird is blind, it cannot get to either feed or water.

Thus, affected broilers will eventually starve, become emaciated, an outlier or a runt and die. Death may occur within hours after the onset of symptoms.

In short, the above chain of events may explain why quite a few of affected, dying or recently dead birds, are large, plump broilers which were in good/excellent condition and show no signs of emaciation due to long term starvation.

Upon posting affected, dying birds or "fresh" mortality it is quite common to find an orange-tinged fluid in the lower small intestine and in the cecum. A non-specific, mild to severe enteritis may also be observed. Also, mucus filled, foamy droppings are often seen on the litter.

Post mortem lesions may include bird dehydration particularly evident on leg shanks. Frequently, none of these lesions are evident when dealing/posting freshly dead, large, rapidly growing broilers quickly succumbing to the problem.

Basis for proper diagnosis

Causative/etiological agent: Viruses were suspected during the initial outbreaks of SMSC. The Delmarva Task Force reported the isolation of an avian adenovirus from flocks experiencing the syndrome. Additional studies on the role of an adenovirus were later done at the University of Georgia. The results of these experiments were not conclusive.

Dr James Davis of the Georgia Poultry Laboratory, together with other US researchers, investigated the problem and found an emerging virus. This virus belonged to the arenaviridae family and was consistently isolated from the droppings of birds exhibiting spiking mortality.

Dr Davis' work showed higher numbers of arena virus particles present in the faeces of broilers, broiler breeders and commercial layers experiencing enteritis. Further, the faeces of chickens exhibiting spiking mortality have been found to contain particularly high numbers of arena virus particles. Since then, Dr Davis and others conducted a number of different experiments and reproduced the syndrome by administering the arena virus to normal birds.

Dr Davis' research indicated that shortly after infection by the arena virus in question, a short period of starvation for the chicken is enough to elicit the syndrome. Thus, it may take more than just a viral infection to bring about the syndrome in broilers.

Particularly, one should give due consideration to other stress factors like periods of poor or marginal feed availability, bird panting and or heat exhaustion during extreme hot weather.

Arena viruses infect areas of the brain which regulate hormone levels in the body, particularly growth hormone. Mice infected with

the arena virus have been found deficient in growth hormone which results in hypoglycemia and in growth depression.

Since arena viruses are also known to infect beetles, mice, rats, other birds such as pigeons, a concerted effort is needed to keep all these pests under control.

Presumptive diagnosis of the problem can be based on the specific timing of field observations. The most usual time window for the occurrence of the problem in broiler flocks is from eight to 18-20 days of age. The condition typically shows up at the beginning of the second and toward the end of the third week of grow out but it can happen as late as 30 - 35 days of age.

Also, there is a sudden onset of the condition and it shows a typical mortality pattern. Initially, only a few affected birds are detected in the field. Then, quite often, from one day to another, morbidity and mortality rise dramatically.

One should give due consideration to other stress factors, such as heat exhaustion, during extreme hot weather.

A loud chirping of a few birds is sometimes an early warning. Too often, birds seem to be thriving. Then, a sudden and unexpected jump in mortality takes place from eight to 14 days of age. The increased mortality lasts for several days, after which, mortality usually returns to a relatively normal level.

Some producers feel the fast growing male broilers in the flock are more severely affected than their female counterparts.

Most troublesome is the fact that affected birds that survive an outbreak never achieve the level of performance of unaffected birds. This situation increases the percentage of birds that must be culled following an outbreak.

Treatment drug options

Sometimes in the face of an outbreak of spiking mortality, field veterinarians report some benefit from a timely and prompt administration of a quinolone antibiotic via the drinking water. This is difficult to assess since viruses are not affected by antibiotic administration.

Glucose or sugar supplementation in the drinking water has also been tried. The goal is to achieve a two per cent concentration in the drinking water via a stock solution utilising a proportioner or a medicator. The treatment is done for one or two days. Ⓑ

This article originally appeared on the Poultry Site.

It is essential to properly maintain all house ventilation equipment and accessories. (Image: Poultrysite)

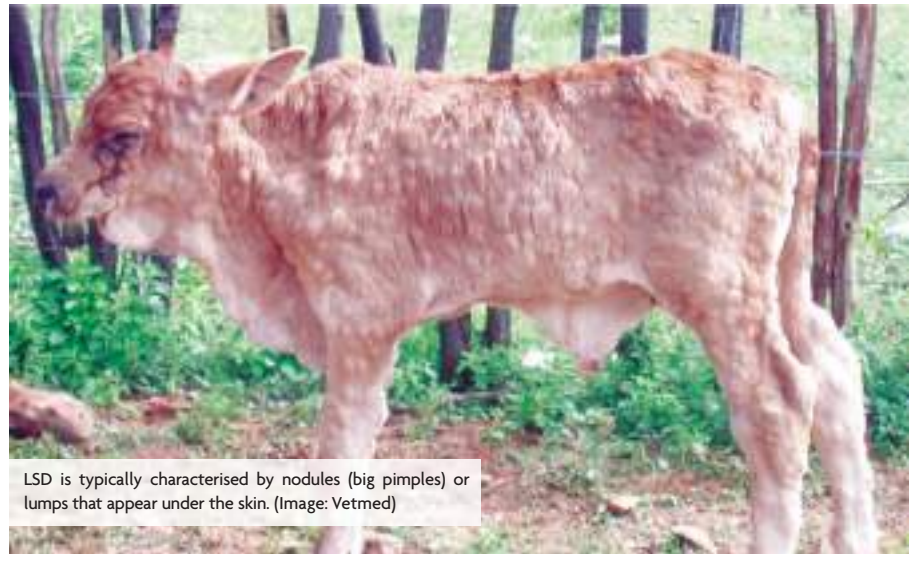
Lumpy skin disease is a poxviral disease with significant morbidity in cattle and is endemic in parts of Africa. Although the mortality rate is generally low, losses occur from decreased milk production, abortion, infertility, loss of condition and damaged hides.

Lumpy skin disease in cattle: a growing problem in Africa

LUMPY SKIN DISEASE (LSD) is an infectious viral disease of cattle transmitted by direct contact with infected animals or if animals are bitten by bloodsucking insects such as flies and mosquitoes. That is why the disease commonly occurs when fly activities are abundant, especially in the wet season or around water points. It occurs throughout Africa and can affect all cattle breeds.

Biting flies play the most important role in spreading the virus, which does not spread readily among animals held in insect-proof pens. While infection by contact can occur, this is thought to occur only at a low rate and is not considered a major component of transmission during epizootics. Calves can be infected by drinking milk from a cow which has the disease. The disease can also spread through the saliva of infected animals when they use the same drinking trough.

Biting flies play the most important role in spreading the virus.



LSD is typically characterised by nodules (big pimples) or lumps that appear under the skin. (Image: Vetmed)

Clinical presentation

It is typically characterised by nodules (big pimples) or lumps that appear under the skin, especially around the face, neck, under the abdomen, on the legs or around the genital areas and udders.

The lumps are hard and are normally of the same size. Many of the lumps become sore and sometimes get infected and can develop into wounds. The lumps form scabs which may persist for months and leave scars after healing. Another prominent sign is the high fever which can go down in one to two days but can go up again. This is followed by drooling of saliva and discharges from the eyes and nose. The cattle become weak and stop eating, resulting in rapid weight loss.

Other signs include:

- Legs which become swollen and develop sores
- Enlarged lymph nodes
- Pneumonia/coughing – as a result of infection of the respiratory tract (the windpipe) and lungs
- Nasal discharge – thick watery to pussy fluid from the nose
- Infertile bulls – due to orchitisu (infection of the testes)
- Infertile cows
- Mastitis – this lowers milk production
- Lachrymation, infection of the eye or even blindness

Diagnosis

A basic diagnosis can be made by the presence of the typical lesions on the skin and in the mouth. In longhaired animals you should feel for the nodules on the skin or you can wet the hair so that you see the nodules more easily.

A definite diagnosis can only be confirmed by a veterinarian by taking samples of the skin to a laboratory, where they can identify the virus (this has to be done because there are other diseases which cause similar signs in cattle and therefore require different methods of control and treatment). If LSD is suspected, it is a notifiable disease and must immediately be reported to the nearest state veterinarian so that it can be confirmed and he/she can help to control the disease.

Lumpy skin disease (LSD) is an economically important disease of cattle and can produce a chronic debility in infected cattle comparable to that caused by foot-and-mouth disease (FMD). Mortality rates as high as 40 per cent or more have been encountered but they are usually lower.

Treatment and control

There is no treatment for LSD-infected cattle. Non-specific treatment (antibiotics, anti-inflammatory drugs and vitamin injections) is usually directed at treating the secondary bacterial infections, inflammation and fever, and improving the appetite of the animal. Sick animals may be removed from the herd and given supportive treatment consisting of local wound dressing to discourage fly worry and prevent secondary infections. Systemic antibiotics may be given for skin infections, cellulitis or pneumonia, and food and water should be made readily available. Local applications of insecticides to infected cattle have been made in an attempt to reduce further transmission, but to no apparent benefit.

When an epizootic occurs in an enzootic area and LSD has already spread extensively, slaughter policies are inappropriate and extensive vaccination campaigns are recommended. The imposition of strict movement controls are suggested because, although these do not contain outbreaks of LSD, they do prevent new foci from becoming established at a

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certain distance. Vaccination will greatly reduce the morbidity and economic effects of an epizootic but may not completely limit the extension of LSD. Follow-up vaccination of calves and re-vaccination programmes over a period of two to three years will greatly reduce the incidence of clinical disease. No country in sub-Saharan Africa, however, has yet succeeded in eradicating LSD once it has occurred.

Vaccines for LSD control

Prevention is the cheapest and best method of control of the disease. If your animals are protected, you will not suffer any production or financial losses as a result of the ill effects of the disease. Two different vaccines have been widely and successfully used for the prevention of LSD in cattle populations in Africa. The attenuated Neethling strain vaccine is a product that contains a weakened LSD virus. When this vaccine is administered the animal will develop protective antibodies (made by white blood cells). These antibodies then resist the actual virus that is transmitted by biting flies or milk and saliva of infected animals The animal is therefore protected or immune. In southern Africa, the Neethling strain of LSD was

Prevention is the cheapest and best method of control of the disease.

passaged 50 times in tissue cultures of lamb kidney cells and then 20 times in embryonated eggs. The strain proved to be innocuous and immunogenic for cattle, although local reactions do occur in a high proportion of animals at the vaccination site. No generalisation of infection has ever followed its use. It is produced in tissue culture and issued as a freeze-dried product.

In Kenya, an effective vaccine has been produced from a local strain of sheep and goat pox virus (SGPV). This was shown to immunise cattle against LSD.

Studies with both the Neethling and the Kenya SGPV strains show that an immunising dose of 103.5 TCID50 is desirable for field vaccination campaigns. Good protection has been obtained with 102 in the face of an epizootic, although there is some suggestion that this may not be the case with all strains.

Serological studies with vaccinated cattle have shown that many animals resist challenge with virulent LSD when they have no detectable fluorescent or neutralising antibody to the virus. Most animals do show a serological response after field infections with LSD, however. There is an important cellular component of the immune response to LSD in cattle, as there is to other pox viruses.

Vaccination for LSD is quite effective as long as it is done annually and the vaccine is stored properly. Most often, when farmers vaccinate only during an outbreak some vaccinated animals may succumb to the disease since they were already infected, but had not yet show clinical signs.

Furthermore, since LSD is transmitted by insect bites, it is also advisable to dip, spray or inject cattle for external parasites before and during the rainy season.

Economic implications

Although LSD doesn't kill animals in large numbers, the devastating economic immplications of LSD are quantified in the cost of the vaccine and the treatment of affected animals. In addition, devaluation of the hides, a decrease in milk production and abortions in some cows are experienced. The worst thing about LSD is the infertility in bulls that most often occurs if infected.

As an expansion and diversification strategy, Milltec has introduced high efficiency silica extraction plants from rice husk ash.

Silica extraction process from rice husk ash

DISPOSAL OF RICE husk, usually around 20 per cent of burned husk, is one of the major challenges faced by millers. Burned rice husk, also known as rice husk ash (RHA) is a great environmental threat, causing damage to the surroundings and drinking water. For every 1,000 kg of paddy milled, about 200 kg (20 per cent) of husk is produced, and when this husk is burned in the boilers, about 50 kg (25 per cent) of RHA is generated.

However, RHA is a good source of high grade silica varying between 75-90 per cent of ash content. The silica present in rice husk, being of biogenic origin, is non-toxic. Also, silica obtained from rice husk is chemically active and hence a useful product.

Milltec's high-efficiency silica extraction plant.

Silica extracted from ash could be used in the following industries:

- Rubber reinforcement (tyre industry)
- Plastic reinforcement
- Agriculture (animal feed)
- Food, healthcare and cosmetics
- Catalyst and coatings
- Pulp and paper processing
- Detergents and soaps

In addition to silica, by-products like activated carbon and sodium carbonate are also extracted from RHA. Activated carbon is used in the filtration industry and sodium carbonate is used in the detergent industry. Silica extraction is based on batch processing and it usually takes around eight hours for one batch of RHA. Milltec can supply one ton and two ton processing plant.

This year's Naivasha Horticultural Fair attracted thousands of show goers interested in learning new ideas in this famed subsector. Mwangi Mumero reports.

Kenya's flourishing flower sector is not all roses

THE EVENT - CURRENTLY in its 14th year - was held in Naivasha at the end of September and brought together various stakeholders in the horticulture sector from Kenya and abroad.

Among the exhibitors present were flower breeders and growers as well as firms dealing with accessories such as greenhouses and pipes as well as financial institutions.

Kenya is the leading export of roses to the European Union with an estimated market share of 38 per cent, according to the Kenya Flower Council (KFC), the umbrella body that brings together players in the sector.

In 2015, at least 121,346 metric tonnes of flowers were exported earning US$629mn in foreign exchange.

The sector employs over 500,000 people in Kenya, becoming an important part of the local economy. It is also a good revenue earner for the government through taxes and levies.

Over 65 per cent of the exported flowers pass through the Dutch Auctions before finding their way into European supermarkets and homes.

While most of the Kenyan flowers head to Europe, other important destinations include the Middle East, Russia and the United States.

At least a quarter of exported flowers are delivered directly providing an opportunity for value addition at source through sleeving, labelling and bouquet production.

Sunny weather in the country enables high quality blossoms to be grown throughout the year, in some cases without the need for expensive greenhouses.

Excellent transport links to Europe and Asia have also provided the country with an eased export environment.

Kenya is the leading export of roses to the European Union with an estimated market share of 38 per cent. (Image: Mwangi Mumero)

New challenges

The Naivasha Horticultural Fair comes at a time when new challenges have emerged even with the already existing problems of certification and taxation.

"The government needs to look into the issue of multi-taxation in the flower industry. The various taxes levied do not augur well for the industry," Mr Richard MacGonnel, Naivasha Horticultural Fair chairman told African Farming.

Over recent years, horticultural farmers have decried the double taxation occasioned by the devolved system of government - from the national and county governments.

While the area around Lake Naivasha is the globally recognised flower mecca, other areas in Kenya also produce huge tonnage of flowers, fruits and vegetables.These include Mt Kenya, Nairobi, Thika, Kiambu, Athi River, Kitale, Nakuru, Kericho, Nyandarua, Trans Nzoia, Uasin Gishu and Eastern Kenya.

The sector employs over 500,000 people in Kenya, becoming an important part of the local economy.

Competition from overseas

Competition from Ethiopia, Rwanda and South American nations such as Colombia is also making players in the sector re-think their marketing strategies.

According to Ms Jane Ngige, the Kenya Flower Council (KFC) CEO, new markets such as Australia, Canada and Japan are being explored, adding that direct flights to these destinations are crucial in the flower business.

"A direct flight to a destination is vital owing to the fact that the fresh produce will need to get to the end user quickly to guarantee quality. It makes it less expensive to export," observed Ms Ngige.

Consultations on a direct flight from Nairobi to the USA are at an advanced stage and flower growers see a silver lining with the anticipated access to the expansive US market.

Ms Ngige noted that support in research and development, use of technology and innovation in value addition will enhance the sectors productivity and sustainability.

There was also a need, she asserted, for regulators and development partners to focus on small-scale growers to enable them to meet stringent requirements for export to the EU market.

Two years, ago, the EU gave stringent conditions to ensure that all produce does not contain more than two per cent of chemicals sprayed on the crop. This condition has been a major challenge especially for small-scale flower farmers.

But it is the failure of Tanzania to sign the comprehensive Economic Partnership Agreement (EPA) between the East African Community (EAC) and the EU that threatens the fledging floriculture subsector.

It will critically injure the flower business leaving Kenya's export exposed to heavy taxation.

These taxes are estimated at being between eight and 12 per cent of the value, with Kenya horticulture risking losing US$40mn a month.

"The uncertainty surrounding the signing of the EPA agreement is a huge concern for the players in the flower industry as well as the Bretix matter," said De Ruiter sales director, Edward Hanning, during the Naivasha fair. De Ruiter is a flower breeder in East Africa.

Without the EPA, the livelihoods of over 600,000 workers - mainly in the flower farms and fresh foods - remains threatened.

KFC's Jane Ngige said failure to sign the pact will put the country in an awkward position as it still needs to access the lucrative EU market.

Adding to the woes of the flower sector is Britain's exit from the EU, expected to complicate matters related to export agreements.

With Kenya's general elections scheduled for August next year, concerns have been raised regarding the rising political temperatures. In the 2007/8 post-elections violence, the flower sector was adversely affected especially in Naivasha where flower workers were evicted and businesses lost.

Unique display by De Ruiter East Africa at their stand during the Naivasha Horticultural Fair. (Image: Flowerweb)

"The rising political temperature is worrying as we head to the next general elections. Most of the foreign investors are cagey about some of the utterances by some leading political lights," said Kamau Njuguna, a flower grower attending the flower fair.

Experts, however, added that that the horticultural sector in Kenya has previously weathered bigger storms, notably the 2007/8 post-election violence and global economic meltdown in 2009.

Food security is one of the greatest challenges facing mankind this century. The world's growing population requires access to food, both in terms of quantity and quality. Adopting integrated nutrient approaches to plant nutrient needs is the best way to meet these challenges, as Tim Guest reports.

Food security through plant nutrition

BEING NUTRITIONALLY ADEQUATE is absolutely essential if an agricultural crop is to be of any use in maintaining the health of a population, providing the nutrients people need in their diets and, in turn, contributing to social welfare and economic growth.

In many countries, particularly where soil conditions are poor, it is now widely accepted that agricultural crops require an integrated approach to the delivery of the wide variety of nutrients needed to produce a healthy and nutritionally valuable food. Integrated nutrient management (INM) or integrated plant nutrition systems (IPNS) combines biofertiliser, mineral and organic resources in an approach that is evangelised by the FAO. The organisation has been involved in field projects and trials of all kinds for many years now and is actively steering countries towards INM adoption. One major problem has been that intensive farming practices have not been well managed in several developing regions and optimal levels of cultivation have been exceeded all too often, to the detriment of the land. The result is that only through a balanced use of organics and mineral fertilisers can such land be revitalised to produce food of suitable quality.

The FAO predicts that by 2030, 199mn tonnes of mineral fertiliser nutrient will be used globally, with the growth rate for its use highest in sub-Saharan, northern and northeastern Africa. Its use, however, will require considerable efforts and expertise to deliver what is required in many regions on the sustained basis in which it will be needed. This is where INM will deliver the most efficient combination of nutrients from all sources, be they existing/remaining soil nutrients, mineral or biofertilisers, as well as organic manures from the widest range of animal sources. There needs to be this combination as in such cases where the soil has been seriously depleted, no one means of delivering nutrients into the soil will suffice.

Good planting material and fertiliser use is essential to produce healthy banana crops.

From FAO to IPNI

In the Georgia in the US, one organisation beyond the FAO, with major regional plant-nutrition programmes in Africa, as well as globally, is the International Plant Nutrition Institute (IPNI), a non-profit, science-based establishment.

The institution partners with leading organisations around the world, adding its strengths to agronomic research, education, demonstrations, training and other endeavors. It strives to ensure all its programmes and training deliver the message that best management practices for nutrient stewardship encourage the concept of applying the right product/nutrient, at the right rate, at the right time and in the right place.

The FAO is now actively steering countries towards INM adoption.

In its Africa Programme, the IPNI provides leadership and direction in plant nutrition research and development working with such partners as national agricultural research and extension systems and universities.

One of the major challenges it is addressing is the extremely low use of fertiliser in much of the sub-Saharan Africa (SSA). It is one of the causes of poor agricultural productivity, with the likes of cereal crop yields having stagnated to under one tonne per ha over the past 50 years, despite a steady year-on-year increase in food demand by three per cent.

With almost 30 per cent of the more than 700mn people living in SSA affected by chronic food insecurity and continued population growth, the IPNI states that cereal crop productivity will have to grow by four per cent annually if the SSA region is to become self sufficient in cereal crop production by 2020 and stay that way.

Between poor agricultural management and infertile soils, land used for agriculture has lost a huge degree of its productive capacity over many decades. Making the situation worse, for whatever reasons, low fertiliser use has exacerbated the problem. However, with that knowledge, one sure way of improving the plant nutrient delivery will be by increasing fertiliser use to turn the tables.

Currently, there are new efforts to raise fertiliser use in SSA from the current eight kg to 50 kg per ha. One way of doing this is to ensure such nutrients are available at affordable prices, which has been a major

obstacle in the past and then to market them effectively to the end user. Research in SSA on soil fertility has also been successful in developing an approach called integrated soil fertility management (ISFM), which provides short-term crop nutrition though a long-term, sustainable level of soil fertility. This approach uses mineral fertiliser combined with organic resources, such as crop and legume residues, animal and compost manure. It also manages the nutrient resources carefully in terms of precise quantity use to ensure optimum agronomic efficiency of the fertiliser, at the same time as avoiding negative environmental impact.

In Eastern and Southern Africa the IPNI's Africa programme is focusing on maize-based cropping, which has a high potential for agricultural intensification. Both subsistence-oriented as well as commercial agricultural systems are being addressed, and the programme is partnering with the IFDC West Africa Division.

The aim together is to conduct research and training activities that will eventually enhance profitability and sustainability of the cocoa and oil palm major cash crops in some of the more humid zones in West Africa through improved nutrient management. It will deliver information on fertiliser access and use in Africa, much of which remains fragmented due to little effort made to consolidate results from varies research.

Because of this inefficiency, the potential impact of different fertilisers on increasingly various crops is hard to gauge; understanding key management practices that contribute most to yield increases is also difficult for the same reason.

What IPNI has done to address this is to collaborate with several research and development institutions to develop a database and information system to collate and analyse data on fertiliser access, use and the potential benefits in Africa. The information is being made accessible to relevant people in agricultural research and development. The IPNI says the database will aid the 'development and dissemination of science-based information on the role of fertiliser in sustainable increases in crop productivity and maintenance of soil resource base', as well as 'highlight cropping systems that offer good opportunities for intensification'.

Cocoa's profitability and sustainability could be enhanced in some of the more humid zones in West Africa through improved nutrient management.

It will also, according to the IPNI, provide an improved understanding of the pathways and knowledge systems necessary to sustainably increase crop productivity in heterogeneous farming systems in Africa.

In the area of site-specific fertiliser recommendations, the IPNI is also collaborating with a number of existing nationally and internationally-funded projects in Africa looking at supporting the design, implementation and trials that will help identify general fertiliser recommendations for different site-specific soil, climate and socioeconomic conditions, all of which have a bearing on what fertiliser should be used.

Extension agents and farmers are also being supported in making informed decisions on nutrient management through the IPNI's work and the programme has established partnerships with the Alliance for Green Revolution in Africa (AGRA) and the African Soil Information Services project, led by CIAT. All of these efforts have the potential to reach millions of farmers.

As a last word, the IPNI is also working closely with the Soil Health Programme of the Gates Foundation on a project to raise awareness of good fertiliser management and ISFM.

Innovative storage technologies introduced

A THIRD OF food – enough to feed 1.2bn people who are hungry and undernourished (223mn in SSA) - produced never reaches the market or consumer due to high post harvest losses. 470mn Africa's smallholder farmers lose 15 per cent of their income annually to post-harvest losses (PHL), according to the FAO, with 20-30 per cent of cereals grown lost. Loss in fruits and vegetables, roots and tubers ranges from 40-80 per cent. Poor storage systems promote aflatoxin contamination, and there is a dangerous level found in cereals and ground nuts, which could lead to liver cancer and stunting.

Poor transport systems, poor infrastructure, lack of cold storage systems all contribute to PHL especially in fruits, vegetables, meats, fish and dairy. A high level of fruit and vegetable waste brought to urban centres and low intra-Africa trading and high import bills amount to US$30bn annually.

Three storage technologies - hermetic cocoons, PICS bags and metal silos - use hermetic technology that creates airtight conditions within a storage structure that prevent pest infestation. The technologies reduce the flow of both oxygen and water between the stored grain or seed and the outside atmosphere. When properly sealed, respiration of grain and insects inside the bag reduce oxygen levels from 21 per cent to five per cent. This reduction reduces live insects to less than one insect/kg of grain without using insecticides, often within 10 days of sealing. The stabilised moisture inside the cocoon prevents wetting and drying of grain

Since 2007 Kenyan post-harvest losses in maize – currently estimated at 23.4 per cent of the total harvest – have constituted about 125 per cent of the country's imports. Reducing these losses by 75 per cent could make Kenya self-sufficient in maize without increasing production.

Nigeria is the largest producer of tomatoes in sub-Saharan Africa. Yet post-harvest losses are estimated at 45-60 per cent. This lack of supply means that it can only fulfil a third of its processing capacity. As a consequence, it is the largest importer of tomato paste in Africa, which costs Nigeria US$127mn in 2012. Nigeria is also the world's largest cassava producer, responsible for 45mn tons annually. However, only 10 per cent of Nigeria's production is processed, compared to over 50 per cent in other major producing countries.

Over 4,200 farmers set to take part in a project testing innovative storage technologies to reduce post-harvest losses in Tanzania.

While technologies to reduce postharvest losses have been developed and piloted, commercialisation remains very low.

- Farmer awareness of the technologies is low/limited
- Technology accessibility and cost constrain farmer adoption
- Appropriate and cost-effective technologies required, eg, mobile dryers, mobile cassava processing units, threshers (investment opportunities)
- More correlation between agricultural challenges to health and nutrition required (siloed approach to problems)
- Poor understanding/appreciation by policy makers of the complex food/nutrition health nexus, requiring more evidence and advocacy knowledge /research gaps
- Social studies needed to understand farmer adoption challenges and prioritisation
- Scale up successful models to reach millions of farmers (470mn smallholder farmers in SSA)
- Policy and advocacy for private sector investment incentives
- Seamless development of value chains and support to value chain actors
- Access to affordable finance for value chain actors
- Public private partnerships to drive the value chains
- The seed industry in future will be controlled by three mega mergers/acquisitions: Dow and Dupont, Bayer buys Monsanto, ChemChina buys Syngenta – climate-resilient crop varieties for developing countries etc? Ⓔ

Getting the measure of mycotoxins is no easy task especially in the wide range of cereal crop commodities providing feed grain and the main ingredients of finished feed. Dr Terry Mabbett reports.

Measuring up to threats from mycotoxins in feed grain

MANY FIELD FUNGAL pathogens and storage moulds synthesise mycotoxins. Each group of fungi, including the aflatoxin-producing Aspergillus moulds or the large number of Fusarium fungal pathogens delivering a broadside of Deoxynivalenol (DON), Zearalenone (ZEA), T-2 and HS-2 mycotoxins, has its own environmental requirements.

Each mycotoxin is the 'signature' chemical and 'calling card' left by a specific fungus or group of related fungi. Many of these highly versatile microbes 'start life' as disease-causing pathogens on cereal crops and subsequently extend into grain spoilage and mycotoxin contamination at any stage along the supply chain from on-farm storage to bags of finished feed.

Mycotoxins in the field

Field factors including fungicide treatment (by seed dressings or foliar sprays), fertiliser treatments and irrigation regimes and the inherent disease resistance of the corn or wheat variety grown will play a part in the nature and magnitude of mycotoxin contamination. And watching over all this cereal agronomy is the weather as a 'wild card'. The majority of cereal pathogens, and certainly Fusarium spp, such as Fusarium graminearum, responsible for wheat head blight and stalk and ear rot in corn, respond favourably to cool, cloudy, moist and humid conditions

Other fungal moulds prefer it hot and dry. A classic case is the aflatoxin-producing Aspergillus fungi and mainly A flavus and A parasiticus. Aspergillus species are predominantly storage fungi and do not generally contaminate cereal grain prior to harvest. However, incidence of drought stress and insect infestation and damage, which are typically high during hot dry weather and growing conditions, may allow infection of standing cereal crops by Aspergillus fungi, and therefore the production of aflatoxin, prior to harvest.

Getting the measure of mycotoxins from now on is a matter of what to test for, at what stage and how often.

Mycotoxins moving into store

Mycotoxin first appears on the panicles of standing cereal crops but cleaned grain arriving at the farm silo or loaded onto trucks for off-farm shipment is the first opportunity to test for what and how much mycotoxin is there. Getting the measure of mycotoxins from now on is a matter of what to test for, at what stage and how often.

Farmers and traders generally know the range of mycotoxins they need to test for in relation to the type of cereal and where it is grown. However, the appearance of one mycotoxin can often act as a 'marker' for others because both are produced by closely related moulds enjoying similar field conditions for infection and mycotoxin production, which means that DON and ZEA frequently occur together. These two mycotoxins are produced by Fusarium graminearum and also by a number of other closely related Fusarium fungi which infect a range of cereal crops.

Custom-built silos are the secret to successful storage of cereal grain. (Image: Alvan Blanch)

Proper grain cleaning to remove all crop debris and especially the glumes (integuments surrounding small grain cereals like wheat) go a long way in preventing mycotoxins and the causal fungal moulds from entering the post-harvest and grain processing stages. The extents to which mycotoxin-producing moulds become active in store, contaminate feed grain and subsequently animal feed, will depend on the grain moisture content and the conditions of storage.

Maintaining the balance

Twelve per cent grain moisture is generally given as the figure below which fungal mould activity ceases but the situation is more complex than that. The moisture level within the grain and in the surrounding air is dependent on temperature because warmer air has a greater water holding capacity

Moisture inside the kernels of stored grain establishes an equilibrium level (balance) with the air outside and the resulting relative humidity (RH) may be sufficiently high to encourage growth of deteriorative organisms, including mycotoxin-making fungi. Bacteria, fungal moulds (including mycotoxin producers) and mites require a minimum RH of 90 per cent, 70 per cent and 60 per cent, respectively. Insects, depending on species, need an RH level of between 30 to 50 per cent.

Grain storage specialists will utilise this information to relate equilibrium moisture content of grain and the RH of the surrounding air for a range of stored cereals. Relationships calculated for a range of cereals stored at a temperature of 25°C are shown in Table 1. Grain moisture content in equilibrium with a RH of 70 per cent (shown in bold type) is the figure beyond which the stored cereal grain becomes at risk of microbial damage and therefore mycotoxin contamination. In practical terms this means grain scheduled for storage at 25°C should be dried to and maintained at that maximum moisture level. Equilibrium grain moisture contents and corresponding RH levels are re-calculated for higher or lower storage temperatures.

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Getting the measure of mycotoxins

Hazard Analysis Critical Control Point (HACCP) has been researched and developed so that farmers, grain managers and feedmill owners know exactly when and where to test along supply chain. Experienced operators are aware of the inherently high risk points where testing is advised. This may be grain loads coming in from different parts of the farm and having experienced different growing conditions including soil moisture and irrigation levels. Mycotoxin testing will alert the farmer to any real-time mycotoxin problems and provide important farm and crop data for use in later years.

Routine testing of grain loads from different sources for mixing in silos or during feed manufacture is clearly a priority for managers of central grain depots and feedmills. Any point along the supply chain where grain and other debris can accumulate, whether in conveyors at the grain store or feed mixers and bins in the feedmill, are high risk points for fungal growth and mycotoxin accumulation.

Mycotoxins are not randomly or uniformly distributed throughout static grain or feed loads but tend to occur in so called 'hot spots' corresponding to damp spots and pockets of mechanically damaged or insect-infested grain that encourage mould growth. Sampling a moving stream of grain, feed ingredient or finished product reduces any selection bias associated with sampling and testing a static load. Static grain loads should be probed many times and all over, with sub samples bulked to produce a more representative gross sample for testing.

Speed and sensitivity of testing have become the twin main thrusts of mycotoxin testing over the last two decades, including actual time taken to obtain an accurate and actionable reading and result. If a test result is achieved on site within minutes then 'rogue loads' can be dealt with promptly and isolated without contaminating the main bulk of grain, feed ingredient or finished feed. When samples were always taken back to laboratories for testing no prompt action was possible for suspicious loads with visible mould or a musty smell without holding up operations.

This need-to-know on-site and on-time led to the rapid development of portable on-site testing equipment like the VICAM Vertu Lateral Flow reader, used to identify and quantify key mycotoxin hazards at critical control points right along the feed and grain supply chain. VICAM has gone one stage further with the introduction of five-minute on-site quantitative strip tests to detect DON (DON-V) and alflatoxins (Alfa-V).

VICAM's quantitative strip tests are designed for use with the Vertu Lateral Flow Reader and can be performed with a minimum of on-site training and technical expertise. These novel tests employ the highly sensitive and selective monoclonal antibodies required to accurately measure DON and alfatoxins in grain or feed material.

The current passion is to drive down testing times to several minutes. More important is the overall on-site picture to allow prompt testing by non-scientists, on the spot and anywhere along the supply chain, to secure prompt accurate and repeatable results over the sensitivity range required. Whether the actual testing time is three or five minutes is secondary.

Weighing with automatic feed supply from raw material bins in Nasarawa State, Nigeria. (Image: Alvan Blanch)

Table 1 Equilibrium moisture levels (g/kg) for selected cereal grains stored at 25°C

Cereal gain at 25°C	Relative Humidity (per cent)						
	40	50	60	70	80	90	100
Barley	97	108	121	135	158	195	268
Corn, shelled, yellow dent	98	112	129	140	156	196	238
Oats	91	103	118	130	149	185	241
Rye	99	109	122	135	157	206	267
Sorghum	98	110	120	138	158	188	219
Wheat							
Soft red winter	97	109	119	136	157	197	256
Hard red winter	97	109	125	139	159	197	250
Hard red spring	98	111	125	139	159	197	250
Durum	94	105	115	131	154	193	267

Equilibrium moisture level expressed as g/kg grain. Divide by 10 to express as per cent moisture content on a weight to weight (w/w) basis. For example 135 g/kg is equivalent to 13.5 per cent w/w.

From: Henry, R.J. and Kettlewell, P.S. (1996) Cereal grain quality. Chapman & Hall. 488 pages

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Tractor operator training programme in West Africa

Barrie Moss, sales support manager Africa from Alvan Blanch, discusses how they train their operators, ideally over a period of four days.

AFRICA, AND NIGERIA in particular, are in urgent need of good practical training for tractor operators. This needs to be done in the field, but is usually done in colleges in a class room and then is very basic.

These programmes tend to cater to groups of 15-20 operators and the schedule starts with the following:

The do's and don'ts for safe operation of tractor and machinery. This includes selecting the right gear and throttle setting for the job, daily service requirements as well as period servicing.

Then it is important to check their abilities. This involves getting operators to drive round in a figure of eight, forward, then reverse. This gives a good idea of an operator's ability to control the tractor, select the right gear, and whether they ride and slip the clutch and control of engine speed. It also provides an opportunity to explain the fundamentals of safe tractor operation and demonstrate how gears in the transmission are grouped, the correct use of the hand throttle to get the right engine speed.

Thresher training - operators are keen to learn.

Day two moves on to the other tractor functions – drawbar, hydraulics and PTO: how they work and correct fitting of implements. This is ideally done together with a manual for the tractors that are being used, so that they can get the correct information in the future.

From there they are shown how to fit a plough – disc ploughs are not easy to set up.

Day three starts with the fundamentals of ploughing: why we plough.

Most operators have no idea why they are ploughing. We look at marking out the field, setting out the lands and correct forward speed. Most are surprised to find that at a slower speed, using a fixed throttle speed and in a straight line ploughing even furrows, they cover as much land as they would bouncing around. And the ploughing is neater. Generally by the end of the third day the operators are keen to learn more. They do like to be proud of what they have achieved. By day four they have mostly got used to the gears and hand throttle.

If the group can stay for a week we cover other operations: Harrowing and cultivation, planting, reversing a trailer safely. Crop spraying is separate course.

It is important to explain why we do certain cultivation operations and how we get a seed bed and why it is important to do these operations correctly.

Knapsack or backpack sprayers have become a major success story throughout Africa, helped by design improvements that can achieve more efficient chemical application and offer user-friendly operation. Mike Williams reports.

Crop sprayer progress

The recently introduced Uniport self-propelled sprayers from Jacto were designed with African markets in mind.

EASE OF USE is important. Commercial grade knapsack sprayers used by experienced operators can achieve highly effective crop protection, but design features such as a comfortable harness, low weight and conveniently located controls help to maintain operator efficiency over long periods. Another useful design feature is the ability to switch between right and left-handed operation.

Knapsack sprayers from the Mexican built Swissmex-Rapid range include the 081 and 101 models with 18 and 21-litre tank capacities selling in South Africa, Ghana and other African countries. They can be used with a full range of crop protection products, and the fact that both models have mechanical agitation allows wettable powder products to be handled. Weights are 5.1 and 5.5 kg with an empty tank and the 081 version can be changed between left and right hand operation by turning the tank through 180°.

A special feature of the Goizper Matabi knapsack range is the use of fibreglass for the hand-held spraying lances.

One of the features of the Swissmex-Rapid 189 and 289 knapsack models is the fact that the piston pumping system can be serviced without using tools, and both are among the top selling Swissmex models in Africa. Tanks sizes are 15 and 20 litres with 4.8 and 5.5 kg net weights. Another popular knapsack option from Swissmex in some African countries is the A-400, a lightweight sprayer weighing only 4.3 kg with 20-litres tank capacity and left or right hand pumping.

Sprayer technology for industry, public health and agriculture is one of a number of commercial activities of the Goizper group based in Antigua. They have nine models in their Matabi knapsack sprayer range with tank capacities from 12 to 20 litres, some of them designed primarily for crop protection. The 12-litre knapsack model weighs 3.12 kg with an empty tank and carries a three-year warranty, and the Super Agro 20 sprayer at the top of the crop spraying range with a 20-litre tank weighs 3.85 kg.

A special feature of the Goizper Matabi knapsack range is the use of fibreglass for the hand-held spraying lances. Standard lance lengths are about 95 cm, but longer versions are available on the options list for special situations including tree spraying, and they include a telescopic version extending to 5.4 metres maximum.

Mesto spray equipment has been made in Germany since 1919 and they currently offer a wide range including compression sprayers for industrial and domestic use as well as knapsack models for crop protection. Capacities for knapsack sprayers range up to 18 litres using plastic tanks working with six-bar pressure, but Mesto's top model is the 3541G Stabilus with an 18-litre tank made of stainless steel instead of plastic. The steel tank operates at six-bar pressure and the specification includes a brass piston pump, padded harness straps plus back padding, and the net weight is 5.2 kg.

Effective chemical control essential for cotton

Cotton can be a valuable cash crop, making it a popular choice for both small and large scale farming, but it is also a crop that attracts a long list of insect pests and effective chemical control is essential for successful production. The development of Controlled Droplet Application or CDA spraying by Micron Sprayers was a major breakthrough in spraying technology for cotton and a wide range of other crops producing small, uniformly sized droplets that achieved high levels of pest and disease control from a small volume of spray liquid.

Micron's ULVA+ sprayer is the popular choice for large numbers of small scale cotton growers, and it is also used for other major crops including groundnuts, tobacco and vegetable production. It was developed to make the benefits of CDA technology available for an extended range of water and oil based insecticide formulations. The ULVA+ introduced a new atomising spinning disc plus an improved motor and a bigger capacity backpack, allowing 10 litres of spray liquid to be applied to one hectare of cotton. Using battery power avoids the need for manual pumping, and the design also combines a high work rate with a low weight.

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The Jacto company based in Brazil is one of the leading sprayer manufacturers, offering a full range of agricultural and horticultural sprayers including knapsack, tractor mounted and trailed models plus self-propelled sprayers. They are sold in more than 100 countries throughout the world and Jacto knapsack sprayers are market leaders in a number of African countries.

A new development introduced by Jacto in 2015 was a battery-operated knapsack sprayer using a rechargeable lithium ion battery as the power source. The equipment list for the sprayer includes a hydraulic agitation system that operates internally to maintain the tank mix, and the smart control panel features an audible alarm to help the operator maintain a constant walking pace. The control features also include lockable five-point pressure control settings, an automatic shut-off plus an indicator to show the battery charge level.

Recent additions to the Jacto range also include the self-propelled Uniport 2530 and 3030 sprayers. The demand for self-propelled sprayers with advanced design features is increasing in some African countries, and Jacto has developed the new models with African requirements in mind. Both models have four-wheel drive with a hydrostatic transmission, and the 3030 model features electronic independent traction control, a GPS positioning link, automatic boom height sensing and individual nozzle control to reduce spraying overlap and minimise unnecessary chemical application. The smaller Uniport 2530 model has 2500 litres capacity and the 28m wide boom is equipped with section control.

Lemken selling well in Africa

Establishing their own subsidiary company in South Africa in 2012 gave a big boost to the Lemken company's machinery sales. The biggest gains so far have been in sales of Lemken cultivations and seeding machinery, but sprayer sales have also benefitted with most of the increase achieved by the Sirius tractor-mounted models. As well as demand in the RSA, sprayers have also sold in other countries including Ethiopia, Morocco, Namibia, Sudan and Tanzania. The biggest gains so far have been in cultivation and seeding machinery sales, but sprayers have also benefited with most of the increases going to the Lemken Sirius tractor mounted sprayers.

Micron's ULVA+ low volume sprayer protecting a cotton crop from insect pests.

Lemken trailed- and tractor-mounted sprayers offer tank sizes from 900 to 6,000 litres, with the Sirius-mounted models available up to 1,900 litres. Special features available on Sirius sprayers include the Lemken EasySpray electrically operated remote control system, and customers who want extra tank capacity with the manoeuvrability of a mounted sprayer can add a Lemken Gemini tank. The Gemini tank is mounted on the tractor front linkage, holding up to 1,100 litres, and adding this to one of the larger Sirius sprayer tanks can match the capacity of a small to medium trailed sprayer.

The Sirius series tractor mounted models account for most of Lemken's increased sprayer sales in Africa.

Zambia is the biggest African market for UK-based Household Sprayers. Most of the demand is for the Spirit, the smallest of their three self-propelled sprayer models, but they also sell their EcoSpray trailed sprayers in Africa. The recently updated version of the Spirit weighs less than 6,000 kg with empty tanks and is powered by a Mercedes engine driving a hydrostatic transmission with wheel motors allowing infinitely variable speed adjustment. The specification includes a 3,000-litre tank, boom widths are up to 28 metres and the underside clearance is 89 cm for the standard model, with a special high clearance model available.

Andrei Botnari, Household's exports manager, says there is growing interest in equipment that can contribute to application accuracy and efficiency, particularly in Zambia, and this has brought increased demand for sprayers equipped with GPS linked section control and automatic boom positioning.

The demand for self-propelled sprayers with advanced design features is increasing in some African countries.

Many advantages with carbon fibre

New technical developments arrive frequently in the crop sprayer market, and the latest innovation from John Deere is a boom made of the space age material, carbon fibre. Claimed to be the first production sprayer boom made of this material, it was announced earlier this year on the John Deere R4050i self-propelled sprayer, with limited production starting next year and full availability scheduled for 2018.

The main advantages of using carbon fibre instead of steel include a big increase in strength compared with traditional steel boom constructions but the weight is about 5.5 times less than steel. Another attraction is that the carbon fibre can flex while the sprayer is working, and this reduces stresses that can cause a steel boom to fracture when working at 20 to 30 kph application speeds.

John Deere will offer the carbon fibre boom initially for spraying at 18 or 36 metres width, and some of the 900 kg weight saving achieved by using the carbon fibre boom instead of a steel version has allowed an increase in the sprayer's tank capacity to 5,000 litres. The power unit is a 6.8-litre John Deere engine developing 235hp rated output or 255hp with power boost.

CE Certification awarded to Bentall Rowlands

WITH OVER A century of experience, Bentall Rowlands Storage Systems, a leading manufacturer in complete storage and processing equipment solutions for the agricultural and industrial market is now CE certified.

This process looks closely at its manufacturing procedures, material flow and documentation. This accreditation means that every item produced by the company complies with the latest European standard for steel structures. Within the factory, material process flow is carefully followed which ensures that the high technical standards of Bentall Rowlands Storage Systems are delivered from raw material to finished product. This ultimately gives its customers peace of mind, knowing that their grain is being stored in the best possible way and is giving them the expected return on investment.

The company offers a wide range of galvanised steel silos and hoppers, water tanks, catwalks and platforms, material handling equipment, cleaning and grading and weighing and drying systems that are assembled worldwide. Bentalls now produce silos in both ANSI and Eurocode versions. The latest version of Eurocode looks in further detail at the loads imposed within the silo by the grain. On the smaller bins this has a lesser effect on the silo

Bentall silo barrels utilise 100mm of pitch of corrugated steel, which adds strength and helps reduce product hang-up.

build-up as the silos are to such a high engineering standard. On the larger silos, the "patch" load is taken into account. When designing these larger silos, it is assumed that a given amount of grain will stick to one side of the silo. This gives an uneven hoop and vertical load which the silo must withstand.

Bentall silo barrels utilise 100mm of pitch of corrugated steel, which adds strength and helps to reduce product hang-up. These are produced from prime high tensile steel. Very high yield strength contributes to a solution that increases the payload capacity and gives higher strength structures. This steel is corrugated and rolled in the company's modern factory using state-of-the-art equipment, ensuring that every sheet is the same. This not only aids assembly but gives a strong, water tight joint. The recently developed new vertical seam bolting pattern still uses a two-row system, reducing erection time over other designs and increasing the bearing capacity of the joint by five per cent. The spun galvanised bolts also help to extend the life of the silo. Rather than relying on edge-to-edge contact or bolt shear to transfer loads, Bentalls uses a horizontal plate to transfer the axial load from stiffener to stiffener.

Compared to other companies, its galvanisation process ensures that it uses G600 as standard, which greatly increases the life expectancy of its silos. In tropical marine areas, you can expect silos to last around 35 years. Countries that have high levels of precipitation and humidity will rely on galvanisation, in order to protect them from this corrosion. ANSI and Eurocode engineering designs are helping Bentalls to remain at the forefront of grain storage engineering capabilities, with key preferred supplier status being achieved with major companies worldwide.

The first farm tractors arrived more than 120 years ago, but design changes to boost performance and efficiency are still continuing. Mike Williams reports.

CVT drive systems like the Vario transmission on this Fendt tractor offer fuel economy benefits when used for transport work.

Tractor transmissions

DRIVERLESS TRACTORS ARE likely to be one of the biggest developments for the future, and prototypes that have already been demonstrated show that the technology is now at an advanced stage. The emphasis in engine design is on efficiency, with much of the current research aimed at developing smaller capacity power units that produce more output from each litre of diesel.

There is also an ongoing programme of transmission development with much of the recent interest concentrated on the continuously variable transmission or CVT, a different type of drive system that first appeared in the 1990s and has established new standards of performance and versatility.

The CVT is a two-in-one unit, combining a gear-driven mechanical transmission with a hydrostatic system that uses an oil flow to transmit the engine power. It offers the benefits of both systems, adding the power efficiency of a mechanical gear drive to the infinitely variable, stepless speed control of a hydrostatic.

As well as the two drive systems to transmit the engine power, a CVT also includes a package of electronics and software that forms the transmission control unit, and this allows tractor manufacturers to programme their CVTs to provide special operating characteristics to suit different work requirements. These can range from heavy slow speed pulling jobs such as ploughing, selecting a more fuel-efficient engine speed for pulling a trailer, while precise slow speed adjustment is available for specialised rowcrop and harvesting operations carried out at creeper speeds.

Case IH Magnum (left) and Magnum Rowtrac tractors have CVT power transmission.

Fendt was the first company to offer a production tractor with a CVT. They called it the Vario transmission, and it made its first appearance in 1995 on the 260 hp Fendt Vario 926 model. The Vario drive system was soon available on other models in the range, and Fendt was the first company to offer this type of transmission on tractors down to about 100 hp.

There is also an ongoing programme of transmission development with much of the recent interest concentrated on the continuously variable transmission

CVTs a major breakthrough

Other manufacturers introduced similar drive systems, mainly in the medium and upper horsepower sectors, making CVTs the first major breakthrough in transmission development since the introduction of the powershift. The Case IH range is an example, with a wide range of models available in African markets with a CVT drive system. These include two Puma series models, five from the Magnum series with power outputs up to 379 hp, plus a further three models from the recently introduced Magnum Rowtrac series with rubber tracks replacing the rear drive wheels.

Special design features for the CVT on Case IH tractors include Active Hold Control, an operator convenience and safety feature, to prevent the tractor rolling backwards when stopped on a gradient, and it also allows the operator to pull away again without having to use the clutch or brakes. Another special feature is Automatic Productivity Management or APM, allowing the transmission to select the optimum driving strategy in order to reduce overall fuel consumption.

Recent additions to the Deutz-Fahr tractor range include the three 9 series models powered by 7.8-litre engines producing maximum outputs from 274 to 336 hp. The standard specification for all three models includes the Terramatic CVT made by the transmission specialist, ZF. The maximum travel speed is 60 kph, but one of the features of the Terramatic system is that a 40 kph travel speed is available at a fuel saving 1350 rpm engine speed.

CVT drive systems are also becoming increasingly popular on telescopic loaders, and recent examples include JCB's new Agri Pro series Loadall models. They feature the new DualTech VT transmission developed by JCB to provide stepless hydrostatic speed adjustment when precise control is needed for lifting, loading and stacking work at speeds up to 19 kph, while a three-speed powershift takes over automatically while travelling at more than 19kph.

The biggest sales success for CVTs has been achieved on European farms where there are more opportunities to benefit from the advantages CVTs offer for light to medium power applications such as road haulage, crop spraying and fertiliser spreading plus light tillage operations. Transmission preferences in Africa are more varied according to John Deere, with most of the CVT sales coming from farms in the south and mainly from South Africa. Generally in Africa the familiar powershift transmissions are much more popular while the simplicity and reliability of a traditional gearbox is the popular option for smaller tractors.

The most popular John Deere transmission option for medium and high horsepower tractors in Africa is the e18 PowerShift transmission, the result of more than 50 years of John Deere powershift development. It has 18 speeds and drivers can choose from Auto, Custom and Manual modes providing ease of operation for all operator levels. The Auto and Custom settings both manage the engine and transmission to match the required travel speed and field conditions while the manual mode requires greater input from the operator.

John Deere high horsepower 9R series tractors feature the recently introduced e18 PowerShift transmission.

John Deere uses the name Infinitely Variable Transmission or IVT for their CVT type transmission. It offers stepless speed control from 50 metres per hour to the 40 kph top speed, and no clutch operation is needed when starting or stopping. An Electronic Management System or EMS provides fully integrated control for the engine and the transmission, maintaining constant communication between both to ensure optimum output and efficiency at any engine speed. The IVT also has an "off" setting which disables the EMS control system and allows the operator to select the engine and transmission settings manually. Ⓔ

Case IH and RMA announce plan to invest in new assembly facility in Algeria

CASE IH HAS announced its plans to open a new assembly site in partnership with its distributor, Rouiba Matériel Agricole (RMA). The facility will be located in Constantine, in the north of Algeria, and it will assemble Case IH tractors ranging from 55 to 98 hp to serve the domestic market. Production is expected to start in April 2017 with an initial workforce of 30 employees.

Case IH is working with RMA to ensure that locally assembled products match the high quality levels Case IH is known for.

The new assembly plant will also have a positive social impact in the Constantine area thanks to the new jobs it will create – 30 in 2017, with the expectation of an increase as production steps up. In addition, the facility will rely on local manufacturers for the supply of specific components.

The facility will assemble the Case IH JX55 T, JX75T, Farmall 80JXM, Farmall 90JXM and JX95 Straddle tractor models, ranging from 55 to 98 hp. These are Case IH's best-selling tractors in the country, which are in particularly high demand among the small to medium-sized farms of the northern region of the country, the most agricultural area in Algeria.

Mr Chouba Salim, one of the first agents of Case IH distributor Rouiba Matériels Agricoles (RMA), is also a small farmer in the Constantine region. Mr Chouba Salim's farm is very typical of the area and he is loyal Case IH customer: "I really appreciate the Case IH JX75T 4WD and JX95 4WD tractors I have; they are extremely versatile, reliable and come at a price well within my budget. They are very well suited to the conditions here, and the basic cab version is ideal for the cold temperatures we can get in this region."

Case IH has established a strong partnership with RMA to provide the professional and efficient support customers need. Headquartered in Algiers, RMA brings to customers the experience it has gained in more than 50 years of operation in the agricultural equipment sector. It provides sales and service support through 12 agents, 12 points of sale and three workshops. Case IH and RMA are investing to further extend the distribution network with 10 additional agents and four more points of sale.

"Case IH has built a good reputation and loyal customer base," commented Mr Melouk Salim, general manager of RMA. "This is due to the excellent quality of the products, as well as the fact that it offers different services that customers appreciate. The excellent quality/price ratio and outstanding service that Case IH delivers, it is undoubtedly the market leader for 75 hp tractors."

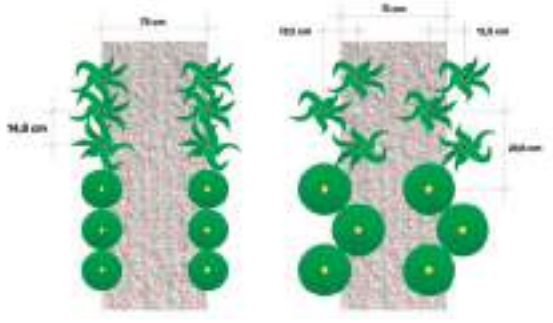
The new assembly site will assemble Case IH tractors ranging from 55 to 98 hp to serve the domestic market.

Higher yield and increased capacity with double rows

HIGH COST EFFECTIVENESS, versatility and convenience – these are the key advantages of the new Duplex Seed drilling process, available on Pöttinger Aerosem PCS seed drill models.

Duplex Seed plants silage and corn maize in double rows, which is claimed to increase yield by up to 10 per cent and increase output during drilling thanks to the higher driving speed. Duplex Seed is presented by the company as an economical alternative to conventional precision seed drilling.

The seed drill model also has the ability to change quickly between seed types thereby offering the flexibility of using one seed drill for cereals and maize. Further key advantages include direct control of the seed flow as well as monitoring of each maize row.



In terms of plant cultivation, the company describe the effects of double row planting as positive. Planting maize in a double row creates the perfect distribution density conditions: more light, more water and more nutrients. Because there is 30 per cent more space between the seeds and therefore 70 per cent more space available for each plant, the roots can spread out in the soil much more easily. The individual maize plants then display less competitive growth behaviour. The roots spread into the free areas.

Double rows can be harvested in exactly the same way as single rows using standard maize headers.

Cat bale grab gives no wrapper damage

CATERPILLAR ATTACHMENTS HAS added a bale grab work tool for skid steer loaders, compact track loaders, multi terrain loaders, and compact wheel loaders having a universal, skid-steer-type interface. The versatile bale grab can grasp, carry, and place round or square baled material, without damaging either the wrapper or the bale. The new work tool's rigid design ensures reliability and long-term durability.

The bale grab is designed to provide optimum machine stability when loading or carrying baled material. Bales of wheat, hay, and other materials for livestock feed or bedding are transported easily to and from the bale wrapper and when moving and storing the material. The rounded arm design allows the bale grab to firmly grasp round or square bales, whether sitting flat or placed side down.

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